

Indicator 17. Area and Percent of Forest Land with Diminished Biological Components Indicative of Changes in Fundamental Ecological Processes (e.g., Soil Nutrient Cycling, Seed Dispersion, Pollination) and/or Ecological Continuity (Monitoring of Functionally Important Species, such as Fungi, Arboreal, Epiphytes, Nematodes, Beetles, Wasps, etc.)

| RPA Region | Diminished Biological Components? | | |
|---------------|-----------------------------------|------|-------------------------|
| | Yes | No | No or Insufficient Data |
| | -----Percent----- | | |
| North | 33.1 | 37.1 | 29.8 |
| South | 0.0 | 43.1 | 56.9 |
| Rocky Mtn. | 18.5 | 29.2 | 52.3 |
| Pacific Coast | 40.5 | 59.5 | 0.0 |
| United States | 20.3 | 40.9 | 38.8 |

Table 17-1. Percentages of forest area in coterminous 48 States with diminished biological components.

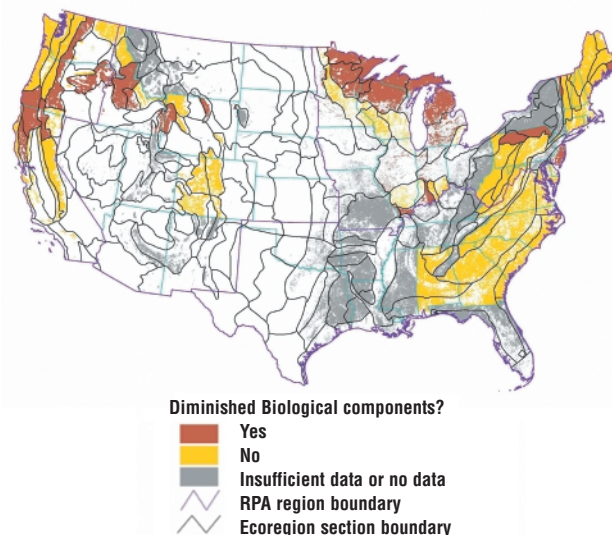


Figure 17-1. Forest area having diminished biological components that may indicate changes in fundamental ecological processes and/or ecological continuity.

What Is the Indicator and Why Is It Important?

The purpose of this indicator is to evaluate the status of fundamental ecological processes that are essential to continued ecosystem health and vitality. Because it is extremely difficult to measure most ecological processes directly, the indicator is framed in terms of biological components of the forest ecosystem that reflect the state of fundamental ecological processes. In some cases, measures of biological components that may be incorporated directly reflect a change in ecological processes or ecological continuity. In other cases, the relationship between the biological components measured and the underlying ecological processes is much less direct or less well understood.

Because forest ecosystems include the entire suite of forest biota, not just trees, data relating to the entire range of forest species could potentially be incorporated into this indicator. The available national scale data, however, relates almost exclusively to trees. In the future, information on other forest biota may be incorporated into this indicator.

What Does the Indicator Show?

At this time, it is possible to only partially evaluate this indicator because (1) national-scale data is lacking on many components of forest ecosystems, (2) available data coverage is incomplete, and (3) fundamental research linking biological components to ecological processes is lacking.

As a first approximation, this analysis used three metrics: tree mortality, tree crown condition, and fire condition class. The analysis was limited to States in which Forest Health Monitoring plots had been remeasured. An ecoregion section was considered to have diminished biological components if (1) average annual mortality volume was more than 60 percent of gross annual growth volume, (2) the ZB-index, an indicator of crown condition, was increasing at a rate of 0.015 or more per year, or (3) more than half of the forest area was in fire Current Condition Class 3 (fire regimes significantly altered; high risk of losing ecosystem components).

Overall, 20 percent of the forest area of the coterminous 48 States (or about one-third of the forest area analyzed) was found to have diminished biological components. Those areas are concentrated in the Lake States and in the Northwestern United States. In several areas, especially northern Minnesota and the Eastern Cascades of Washington and Oregon, mortality is high and a large proportion of forest is in Condition Class 3. This high proportion of the forest in Condition Class 3 suggests that high mortality may be producing high fuel loads for fire or that fire suppression and/or other past management may have produced a large proportion of overmature, senescent stands.